

AMENDMENTS TO THE CLAIMS

1-9 (canceled).

10 (new). A magnetic thin film manufacturing method for iron nitride thin films, the magnetic thin film manufacturing method comprising the steps of:

providing a substrate;

5 carrying out an opposed-target DC sputtering method to form on said substrate an iron nitride thin film having a nitrogen martensite α' phase, said opposed-target DC sputtering method including the steps of:

10 introducing Ar and N₂ gases into a film formation chamber holding said substrate, said N₂ flow rate 8% to 25% with respect to the total gas flow rate to form a single phase nitrogen martensite α' phase;

applying DC power to an iron target in the Ar and N₂ gas atmosphere; and

15 forming said iron nitride thin film at a rate of 200Å/min; and

heating treating said substrate after carrying out said opposed-target DC sputtering method.

11 (new). The magnetic thin film manufacturing method of claim 10, in which an electron voltage during the formation of

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the iron nitride thin film is within a range of 0.01 - 1 eV, and an electron density is within a range of 1×10^9 - 1×10^{10} cm⁻³.

12 (new). The magnetic thin film manufacturing method of claim 10, in which said substrate has an iron (α - Fe) thin film surface formed thereon as a base layer.

13 (new). The magnetic thin film manufacturing method of claim 10, in which after iron nitride thin film formation, heat is applied to the thin film while in a vacuum.

14 (new). The magnetic thin film manufacturing method of claim 13, in which the conditions of said heating are such that a temperature is within a range of 100 to 180° C, and said heating is conducted for a period of time within a range of 1 to 3 hours.

15 (new). The magnetic thin film manufacturing method of claim 10, in which said iron nitride thin film contains an α'' crystalline phase (Fe_{16}N_2).

16 (new). The magnetic thin film manufacturing method of claim 11, in which said substrate has an iron (α - Fe) thin film surface formed thereon as a base layer.

17 (new). The magnetic thin film manufacturing method of claim 13, in which said substrate has an iron (α - Fe) thin film surface formed thereon as a base layer.

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18 (new). The magnetic thin film manufacturing method of claim 11, in which after iron nitride thin film formation, heat is applied to the thin film while in a vacuum.

19 (new). The magnetic thin film manufacturing method of claim 12, in which after iron nitride thin film formation, heat is applied to the thin film while in a vacuum.

20 (new). The magnetic thin film manufacturing method of claim 11, in which said iron nitride thin film contains an α'' crystalline phase (Fe_{16}N_2).

21 (new). The magnetic thin film manufacturing method of claim 12, in which said iron nitride thin film contains an α'' crystalline phase (Fe_{16}N_2).

22 (new). The magnetic thin film manufacturing method of claim 13, in which said iron nitride thin film contains an α'' crystalline phase (Fe_{16}N_2).

23 (new). The magnetic thin film manufacturing method of claim 14, in which said iron nitride thin film contains an α'' crystalline phase (Fe_{16}N_2).